Plastics Design and Manufacturing

Montana Manufacturing Extension Center

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Client Profile:
Plastics Design & Manufacturing (PDM) manufactures plastic injection molding at its facility in Manhattan, Montana. The company currently employs 6 people.

Situation:
While developing its new business plan, PDM encountered a promising alliance with a local hunting and shooting sports manufacturer to enable co-oping space in a new facility. One company has proprietary products and dedicated machines producing the parts they sell. PDM is a contract manufacturer with flexible machines, set up for quick changeover, and handling a wide variety of plastics. Not considered competitors, the two share similar needs such as flow of materials, environmental conditions and utility configurations for running molding machines, cranes for lifting heavy molds for installation on injection machines, shipping and receiving. Blending needs in the new space would cut many overhead costs in half. Creating a harmonious and functional space for two growing firms under one roof posed challenges, however. PDM turned to the Montana Manufacturing Extension Center (MMEC), a NIST MEP network affiliate, for expertise in laying out a well-designed space to accommodate those needs.

Solution:
The layout project was a collaboration between MMEC and the two companies, bringing the considerable experience in the industry to the table with established layout design modeling techniques, analytics and systems expertise. Capturing inputs from both companies through an interview process enabled MMEC to document key objectives and important assumptions about operational and growth needs, and to capture space requirements, activity relationships, and worker needs, wants and any constraints. MMEC added expertise, clear communication and a visual plan for moving forward. They provided full-size plans with five different variations to explore. Ideas were approached from a cause and effect view that was very beneficial to understanding for both companies project teams. Many assumptions run in the background as a facility design is considered. These must be itemized for clarity of the project and for consistency in communication with stakeholders, contractors, equipment suppliers and others involved in the design and end facility. Such factors included future equipment purchases; where front office locations are envisioned; typical order sizes each company will encounter; and unique temperature, humidity and storage needs for processes/equipment, if any. It also covers 'wants' that improve work conditions or employee morale and 'needs,' or must have items. Core relationships for activities, areas, functions and major building features that existed and how each interacts or relates to other areas or functions were analyzed using a Relationship Matrix. The Matrix helps express the desired relationship strength, between the areas of the shop and offices and brings critical relationships to the surface. The resulting data enabled MMEC to create several viable layouts for more feedback from the two firms. The teams selected the preferred layout and features they wanted from alternate layouts before a final iteration was approved.

The design was set up to allow expanded production molding by adding machines in the existing building and then to enable expansion of the facility to the south. According to the MMEC Field Engineer, designing a facility layout before construction is ideal for optimizing needs/wants. When done after buildings are already constructed, essential interactions between the shop floor and administrative functions, stability of environmental conditions for production areas and other such factors can be compromised, impeding efficiencies, communication and even safety. With new construction, an efficient, well-designed layout was able to be provided to architects and contractors who then applied their expertise on building standards and costs to bring the facility to fruition in the best way possible.

Results:
* Projected sales increase of 10 to 20 percent.
* Projected cost savings of $3,000 to $5,000.

Testimonial:
"I look forward to strengthening the relationship with MMEC. The Center's responsiveness is unlike any I've run across before. It is the ultimate flexibility with knowledge behind it that we appreciate."
Mike Groff, President